A MATTER OF PREFERENCE - LECTURERS Vs. TEACHING - ASSISTANTS IN TUTORIALS

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ABSTRACT

In many universities and colleges around the world, it is an accepted practice to supplement frontal lectures of courses with separate practice classes or tutorials. For this purpose lecturers may sometimes use the services of teaching-assistants to conduct the tutorials. Teaching-assistants conduct tutorials in many courses in Israel's academic institutions, especially where core classes and tutorials are separate.

The paper presents the results of a comprehensive instructors' assessments survey conducted in Israel's largest public college in 2004. In this survey, students in small tutorial groups, typically comprised of 15-35 participants each, rated their instructors. Students assessed the performance of two different types of instructors: fully accredited lecturers (including instructors, lecturers, senior lecturers and professors), who were also in charge of the core course, and teaching-assistants (usually Ph. D. candidates), who were formally responsible solely for the tutorials and accountable to the accredited lecturers.

The research explored the differences between students' assessments of lecturers in plenary (or core) classes and small-group tutorial settings, as well as the students' course grades in each tutorial setting (be it a core class conducted by the lecturer or a small-group tutorial conducted by the teaching-assistant). It also explored the differences between students' assessments of lecturers and teaching-assistants.

Contrary to expectations based on previous research done in the world, the findings of the present study fail to indicate differences in either students' assessments of the teachers in charge of the tutorials or in the students' course grades by tutor status (lecturer or teaching-assistant).

The findings of the present study indicate no academic justification for dividing course work between lecturers and teaching-assistants. Both lecturers and teaching-assistants were judged to be equally effective as tutors, and equally contributed to students' success as translated into grades. Such division does, however, have a major budgetary advantage. Teaching-assistants are much more cost-effective. Furthermore, this division provides teaching training opportunities and experience for junior faculty members functioning as tutors.

INTRODUCTION

In many universities and colleges around the world, it is an accepted practice to supplement frontal lectures of courses with separate practice classes or tutorials. For this purpose, instructors may sometimes use the services of teaching assistants to conduct tutorials and/or check submitted course work and assignments. Teaching assistants (usually Ph. D. candidates) conduct tutorials in many courses in Israel's academic institutions, especially where classroom lectures and tutorials are separate. Tutorials are also known as discussion groups or seminars (Griffiths, 1999); or as supplemental instruction (SI) programs (Cuseo, 2001).

The rationale behind tutorial sessions is the understanding that certain subjects require more than passive attendance of a frontal lecture. Introductory courses as well as difficult courses (typically known as “high risk” or “killer” courses) with high dropout or failure rates are typically targeted for this supplemental instruction strategy (Cuseo, 2001). Although lectures play an important role in the social

sciences, in introducing issues and relevant literature, such courses also require students to read, discuss and write about the subject material (Guilherme, 2004). In faculties where courses are of a more scientific or technical nature, tutorials are designed to aid students attain an acceptable level of competence in the more technical components of the relevant disciplines and help them with their general understanding of the course material.

Tutorials provide an appropriate forum for discussion, an incentive for reading, and preparation for writing (Hawley, 2002, 90). Indeed, the main characteristics for a good tutorial, as far as tutors are concerned, include sufficient time allotted to discussion, and accepting students as partners (Ravens et al., 2002). Tutorials also provide an opportunity to clarify concepts that must be mastered in order to cope with the course (Yirtue & Terre Blance, n.d.). Likewise, tutorials are a structured opportunity for students to receive assistance when the material is not sufficiently understood. Tutorials are also designed to expand students' grasp and understanding of the material. However, when tutorials are improperly used to teach material that is distinct from the lecture, the tutorial fails to fulfill its intended objective.

All in all, there is a wide consensus that tutorials are basically designed to enhance effective learning (Condravy, 1995; Hawley & Valli, 2000) through the implementation of the principles of retention and application. Retention and applications represent the two fundamental components of learning, and the combination of understanding and remembering in a way, which is amenable to recall. Understanding is “not simply learning the material well enough to pass a test. Effective learning is the complete understanding of the material so that it can be applied to situations or new material in the future” (Condravy, 1995).

Thus, tutorials are intended to add clarification, enhance in-depth understanding and the ability to apply the material in the future, as well as to provide an opportunity to respond to and discuss students' questions. Therefore, in contrast to lectures attended by dozens and sometimes hundreds of students, tutorials take place in small groups. The tutor's job is to identify and elucidate the topics in which students encounter difficulties, introduce problematic issues in a manner, which is distinct from the lecture presentation, or discuss sources and literature which are required reading. Tutors when they are teaching assistants - also function as mediators between students and the lecturer.

Research literature confirms the contribution of tutorials to academic courses, while tutors are perceived as an essential element in course success (Hativa, 1997). Lecturers or instructors and teaching-assistants maintain interdependence, in that their performance is linked to one another (Davidovitch, 2003); Coordination between lecturers and tutors regarding lesson content, level of understanding, type of explanations and illustrations used and other teaching elements is extremely important (Selvanathan, Selvanathan & McLean, 2001; Smith & Walpole, 1998; Martin et al., 1995). Literature also highlights practical methods for enhancing such coordination (Hativa, 1997, pp.7-8). Efficient use of tutorials to promote students' course learning requires considerable efforts and an ongoing dialogue on part of both lecturer/instructor and tutor. All types of effective teaching behaviors relevant to the lecturer, also apply to the tutor: lesson organization, clarity, positive attitude towards students, and effective use of lesson time (Gibbs, 1981). Other crucial characteristics necessary for a good tutorial are the tutor's ability to respond to students' needs, tutor's knowledge of the course structure, and tutor's ability to encourage independent thinking in the students (Feletti et al., 1982).

The following paper deals with three basic questions related to the effectiveness of tutorials:

- Who, in the long run, is more effective in conducting tutorials in so far the students' grades are concerned- lecturers or teaching-assistants?
- Who is more highly assessed by the students- lecturers or teaching-assistants?
- How important is the coordination between the person in charge of the core class and the person in charge of

the tutorial in so far students' grades are concerned?

It also tries to tackle another question, viz., is there a connection between the following variables: students' personal and academic background, students' course grades, their assessment of those in charge of the tutorials and of the degree of coordination between lecturers and tutorial sessions.

Students Assessments of Lecturers and Teaching-Assistants

Studies conducted in various institutions and countries indicate differences in average assessment ratings of instructors by the students in each discipline (Cashin, 1990). This finding raises the question if such differences also exist in respect of students' assessment ratings of teaching-assistants.

The question stems from the difference in classroom size: While lectures are typically attended by a large number of students, tutorials take place in more intimate forums and small groups. Studies have shown that students' assessment ratings of their teachers in large classes are significantly lower than assessments for teachers in small classes (McPherson, 2003; Wigington et al., 1989; Feldman, 1984; Whitten & Umble, 1980). Therefore, it is interesting to examine whether average assessment ratings are different for courses in which the instructor in a large-class forum teaches both lectures and tutorials, and for courses in which instructors give the lecture in a large group and teaching-assistants teach small groups of students in tutorial sessions.

Here, the researcher faces another interesting dilemma: On one hand, based on theoretical and empirical literature, it seems that the level of experience and rank of the instructor are significant determinants of his assessment by the students (McPherson, 2003). This means one could expect higher assessment rankings of lecturers by the students, since the teaching-assistants are relatively inexperienced in comparison to the lecturers. On the other hand, research dwelt on the positive impact of young assistants teaching on the students. In fact, one longitudinal study that included a national sample of some 500,000 students and 1,300 institutions of all types came to the conclusion that tutorship by young assistants has the strongest correlation with students' “scholarship” self-concept, and also correlated strongly with all academic outcomes measured (Astin, 1993). There is a basic contradiction here, which the present study was designed to address.

Students' Course Grades

Studies (e.g. Dalziel, 1998) also point to the relationship between students' course grades and the nature of the course. Therefore, it is also interesting to investigate the difference in students' average course grades, comparing courses whose tutorials are taught by lecturers with courses whose tutorials are taught by teaching assistants. We hypothesized that the difference in teachers' status would also be reflected in students' grades.

The literature on tutorials (Menges & Mathis, 1998) also addresses students' coursework assigned as homework and designed to encourage and guide them to pose questions. The literature also notes preparatory reading as part of the activities students perform to prepare for the course. According to the literature, assigned reading is designed to foster students' critical perspective on the reliability of the sources they use for study. Literature also notes the significance of tutorial in on-line academic courses (Poznak & Rosner, 2004; Cashin, 1990) as part of the objective to develop independent thinking. The research set out to explore the connection between the coordination between lecturer and teaching assistant, and its impact on students' course grades.

A report of a previous feedback survey conducted in the College in 2003 (Davidovitch, 2003), indicated several personal and academic variables (like age, gender, previous academic record, faculty, course attendance, etc.) that contribute to the explained variance in students' assessments of their lecturers and tutors. The analysis indicated that these variables affect students' ratings. Therefore, the research set out to explore whether these variables also affect students' achievements, comparing lecturer-only and combination lecturer-teaching assistant

courses.

Study Population and Methodology

The study was conducted in the College during the second semester of the 2003-2004 academic years, based on the instructors' assessment survey (teaching feedback) questionnaire distributed to the students. Students filled questionnaires during classes, in the final three weeks of the semester. We explained to the students that the information they provided would be used exclusively to assess instructors and courses. The questionnaire was anonymous. Time to complete the questionnaire was not limited; students completed their questionnaires in about 15 minutes.

The following study refers to assessments for 222 courses in which tutorial sessions were held on a regular basis throughout the entire semester. Students in these courses completed a total of 6,319 questionnaires concerning 113 tutors, including lecturers who teach both lectures and tutorials.

The questionnaire was comprised of two items concerning the course tutor and perceived lecture-tutorial coordination.

Statistical Processing

Statistical processing was performed by course, instructor and tutor.

Chi square tests examined the connection between the course instruction style and faculty. Two-way analysis of variance was applied to tutor assessments, perceived lecture-tutorial coordination and course grades, by instructor type and faculty. Pearson coefficients were calculated for the correlation between students' personal and academic background attributes and students' assessment of tutor, course grades and perceived lecture-tutorial coordination. Finally step-wise regressions were performed to predict students' course grades from their background attributes and assessment of tutors.

The analysis of data in this study incorporated the following items from the survey questionnaire: faculty, gender, age, course attendance (up to 40%; between 41%-70%; over 70% of all classes), and general assessment of instructor (on a 5-point Likert scale, 1 being the lowest assessment). We also used general assessment of tutor and perceived coordination between instructor and tutor (in courses with separate lectures and tutorials), both rated on a similar 5-point scale. We used average course marks, taken from the College administrative computer system. The research questions referred exclusively to courses that included tutorials.

Finding Lectures and tutorials by faculty

All in all, it was found that of the total 769 courses conducted in the College, 22% were comprised of lectures and tutorials. A significant correlation was found to exist between the number of hours allotted for tutorials and the faculty ($X2(10) = 164.99$, $p<.001$). Very few tutorials were given in Architecture, and the School of Healthcare Sciences. The number of tutorials given in the Faculty of Social Sciences and Humanities was also relatively small; in these faculties, 80.9%-98.5% of all courses are not supplemented by tutorials. Yet, in the Faculty of Social Sciences & Humanities all the introductory courses were supplemented by tutorials. The tutorials conducted in this faculty comprised 39.6% of all tutorials conducted in the college. It also had the highest number of tutorial classes. In the Faculty of Engineering, 59.2% of the courses did not offer tutorials. In the Faculty of Science, most courses were supplemented with tutorials and only 32.5% of the courses there lacked tutorials.

Lecturers functioned as tutors in a minority of courses (23%). In 77% of the courses including tutorials, the tutor is not the course lecturer, but rather a teaching assistant.

Faculty	Number of classes	Tutor is course lecturer (%)	Tutor is teaching assistant (%)
Engineering	71	16.9	83.1
Social Sciences & Humanities	88	40.9	59.1
Science	56	3.6	96.40
Healthcare Sciences	6	0	100
Architecture	1	0	100
Total	**222**	**22.5**	**77.5**

Table 1: *Distribution of Tutors by Status and Faculty*

Table I presents the distribution of tutors by status (lecturer or teaching assistant) and by faculty

Table I indicates that in approximately three quarters of all courses supplemented by tutorials, tutors were teaching-assistants. In the Faculty of Social Sciences and Humanities, the percentage of lecturer-tutors was prominently high. It was much higher than in other faculties.

Our first research question pertained to the difference in assessment ratings by tutor status (tutor status also implied the size of the tutorial setting) and by faculty. These ratings were measured using the general tutor assessment item. A two-way analysis of variance was performed on this item, by tutor status and by faculty. The faculties of Architecture and Healthcare Science were not included in this analysis due to the small number of courses supplemented by tutorials in these faculties.

Table II presents the results of the variance analysis for students' ratings of their tutors, by tutor status and faculty*

No significant differences were found as a function of tutor status (F(1,209)=2.13, p>.05) or faculty (F(2,209)=0.43, p>.05(or between tutor status and faculty (F(2,209)=0.09, p>.05). It is important to note that the analysis took into

Faculty	Teaching assistant tutor			lecturer-tutor			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Engineering	59	3.80	0.84	12	4.21	0.70	71	4.00	0.82
Social Sciences & Humanities	52	3.80	0.92	36	4.18	0.69	88	3.99	0.85
Sciences	54	3.64	0.72	2	3.80	0.53	56	3.72	0.71
Total	**165**	3.75	0.82	**50**	4.06	0.68	**215**	3.91	0.81

N = number of courses included in the analysis
** 5-point scale, with 5 reflecting the highest assessment rating*

Table 2: *Results of the variance analysis for students' ratings of their tutors, by tutor status and faculty*

account the fact that faculties had different numbers of tutors and instructors.

Our second research question pertained to differences by faculty in students' assessments of the coordination between lectures and tutorials, in courses where tutorials were given by instructors in large groups, and courses where tutorials were given in small groups by teaching assistants. Table III presents the results of the variance analysis performed on students' assessments of the coordination by faculty and tutor status.

Significant differences in assessments of lecture-tutorial coordination were found by tutor status (F (1,209) =10.59, p<.01). In courses where tutors were teaching assistants, lecture-tutorial coordination was assessed as lower

Tutor status	Teaching assistant tutor			Instructor-tutor			Total		
Faculty	N	Mean	SD	N	Mean	SD	N	Mean	SD
Engineering	59	3.68*	0.80	12	4.24	0.84	71	3.77	0.82
Social Sciences & Humanities	52	3.54	0.88	36	4.32	0.61	88	3.86	0.87
Sciences	54	3.57	0.72	2	4.28	0.02	56	3.59	0.72
Total	165	3.60	0.80	50	4.28	0.65	215	3.94	0.82

N = number of courses included in the analysis
** 5-point scale, with 5 reflecting the highest assessment rating*

Table 3: *Students' Assessment of Coordination by Faculty and Tutor*

(M=3.60) compared to courses where lecturers were also tutors (M=4.28). No significant differences were found by faculty (F(2,209)=0.02, p>.05), or between tutor status and faculty (F(2,209)=0.27, p>.05).

Our third research question pertained to differences in average course grades by tutor status and by faculty.

No significant differences were found in students' grades by tutor status (F (1,203) =0.39, p>.05). Significant differences in students' grades by faculty were found (F (2,209) =4.74, p<.01). Average grades were higher in the

Tutor status	Teaching assistant tutor			lecturer-tutor			Total		
Faculty	N	Mean	SD	N	Mean	SD	N	Mean	SD
Engineering	57	73.55	8.70	11	72.35	7.99	68	72.95	8.54
Social Sciences & Humanities	51	77.00	6.83	35	77.67	7.34	86	77.42	6.67
Sciences	53	70.95	7.61	2	76.74	1.15	55	73.84	7.55
Total	161	74.09	8.13	48	75.38	7.29	209	74.74	7.97

N = number of courses included in the analysis
** 5-point scale, with 5 reflecting the highest assessment rating*

Table 4: *Average course grades (%) by tutor status and faculty*

Faculty of Social Sciences and Humanities (M=77.48) compared to the Faculty of Engineering (M=73.35) or Science (M=71.15).

No significant differences were found in students' grades by tutor status (F (1,203) =0.39, p>.05). Significant differences in students' grades by faculty were found (F (2,209) =4.74, p<.01). Average grades were higher in the Faculty of Social Sciences and Humanities (M=77.48) compared to the Faculty of Engineering (M=73.35) or

Science (M=71.15).

Our fourth hypothesis related to the relationship between students' personal and academic background, their assessment of their tutors and their assessment of lecture-tutorial coordination. To check this hypothesis, Pearson correlations were calculated between personal background factors (gender, age and student's special needs) and academic background factors (year, pervious academic attainments, class attendance, course type), and their assessments of their tutors and of lecture-tutorial coordination. This hypothesis was not confirmed. No correlation was found between students' personal and academic background to assessments of tutors or perceived lecture-tutorial coordination.

Our hypothesis pertained to the relationship between students' personal and academic background factors, their assessment of tutors, their assessment of lecture-tutorial coordination and students' average course grade.

To check this hypothesis, we calculated two-tailed Pearson coefficients between students' background factors, their assessment of tutors, their assessment of lecture-tutorial coordination and their average course grade.

Several variables were found to have affected students' achievements: One is Gender (r=.35, p<.001) (the higher the percentage of female students, the higher the average course grade); another is Age (r=.24 p<.01) (the higher the percentage of students between the ages of 18-24, the higher the average course grade). Negative correlations were found between the percentage of students between the ages of 25-30 and course grade. A correlation was found between students' attendance rate and course grade (r=.18, p<.05) (the higher the percentage of students who attended between 41%-70% of the course, the higher the average course grade).

A positive correlation was found between assessments of lecture-tutorial coordination and course grade (r=.24, p<.01) (the higher the perceived coordination, the higher the course grade). A positive correlation was also found between assessments of tutors and course grade (r=.23, p<.01) (the higher the tutor's assessment, the higher the course grade).

Percentage of	correlation
Women	0.35***
Students aged 18-24	0.24**
Students aged 19-29	-18*
Students aged 30-34	-0.20**
Students aged 35-39	-0.16*
Students over the age of 40	-.009
Students in Semester A	0.04
First year students	-0.02
Second year students	-0.04
Third year students	0.06
Fourth year students	0.07
Fifth year students	0.02
Students holding practical engineering degree	-0.33***
High school graduates	0.35***
College preparatory program students	0.001
Graduates of certificate programs	0.04
Students with special needs	0.02
Students who attended over 71% of course classes	-0.16*
Students who attended under 40% of course classes	0.002
Students who attended 41% -70% of course classes	0.18*
Students for whom course is an elective course	0.15*
Students for whom course is a required course	-0.15*
Students for whom course is non-mandatory	0.04
Tutor assessment	0.23***
Lecture-tutorial coordination	0.24***

*p<.05 **p<.01 ***p<.001

Table 5: *Pearson coefficients of students' background factors, students' assessments of tutors and lecture-tutorial coordination and average course grade.*

In an attempt to predict students' grades, we performed step-wise regression by course. In courses with teaching assistants, stepwise regression used the following predictors: assessment of lecture-tutorial coordination, assessment of tutor, percentage of students in each age group, percentage of students in each course type, percentage of female students, percentage of students by year of study, percentage of students by academic background, percentage of students with special needs,

course attendance, faculty and tutor status.

The above variables were found to predict 29.8% of the variance in course grades (F(5,210)=17.80, p<.001). It was found that possession of high school matriculation diploma predicted 14.4% of the variance: the higher the

Predictors	b	beta	t	R2 Change
Step 1				.144*
High school graduates	.10	.38	6.01*	
Step 2				.066*
High school graduates	.09	.35	5.71*	
Lecture-tutorial coordination	2.53	.26	4.20*	
Step 3				.037
High school graduates	.10	.40	6.44*	
Lecture-tutorial coordination	2.29	.23	3.86*	
Required course	.08	.20	3.21*	
Step 4				.027
High school graduates	.06	.25	2.99*	
Lecture-tutorial coordination	2.38	.24	4.07*	
Required course	.09	.21	3.47*	
Female students	.06	.23	2.81*	
Step 5				.024
High school graduates	.06	.25	3.11*	
Lecture-tutorial coordination	2.48	.25	4.30*	
Required course	.08	.19	3.19*	
Female students	.06	.22	2.78*	
Attended less than 70% of classes	.20	.16	2.68*	

*p<.01 ***p<.001 R=.55***

Table 6: *Standardized regression coefficients to predict course grade*

percentage of high school graduates, the higher the average course grade. Lecture-tutorial coordination contributed 6.6% of the variance: the higher the assessed coordination, the higher the average course grade. In the third step of the regressions, it was found that the percentage of students participating in a required course contributed an additional 3.7% to explained variance: the higher the percentage of students taking the course as a required course, the higher the average course grade. In the fourth step, it was found that female students contributed an additional 2.7% of the variance: the higher the percentage of female students, the higher the average course grade. In the final step, the percentage of students who attended up to 70% of the classes contributed an additional 2.4%. In the final step of the regression, it was evident that the variables' contribution to explained variance, in descending order were: possession of a high school diploma (beta=.25, p<.001), lecture-tutorial coordination (beta=.25, p<.01), female students (beta=.22, p<.01), mandatory course status (beta=-.19, p<.01) and finally, students attending up to 70% of the classes (beta=-.16, p<.01).

Summary

The academic system maintains a differential division between the functions of course lecturers and tutors. While lecturers aim to teach the subject material at an appropriate level for the majority of the course students, the objective of the tutor is to assist students, introduce ancillary material relevant to the course contents, clarify material or introduce difficult material in a manner which is different from its presentation in the lecture. Therefore, it is argued that tutorials may fail to meet their objectives when course instructors also function as tutors. In this case, instructors may use tutorials as regular supplementary lectures. Therefore, it is advised to have two different individuals perform these functions. Another advantage of tutorial taught by teaching assistants is the more intimate setting which allows for a more personal relationship, positive interactions, more effective handling of comprehension problems, and budgetary savings or cost effectiveness (Since the cost of a full fledged lecturer is much higher than that of a teaching-assistant).

In view of these academic and budgetary considerations regarding the desired tutor identity and tutorial class size, the research explored the differences between assessments of tutors in plenary (or regular) classes and small-group tutorial settings, and students course grades in each tutorial setting.

Students' grades were expected to be higher in tutorials taught by teaching assistants, under the assumption that the tutor's personal treatment of students would contribute and be reflected in course grades. It was estimated that the importance attributed to tutorials by the students, reflected in their open-ended remarks on the questionnaire forms, would contribute to satisfaction levels and be reflected in assessment ratings and course grades.

The findings of the present study fail to indicate significant differences in students' assessments of the tutors or students' course grades, by tutor status. Findings indicated that the only variable related to students' course grades was student's faculty. Differences in students'

course grades in various faculties were a function of variables unrelated to the present study.

The findings of the present study therefore indicate no academic justification for dividing course work between lecturers and teaching assistants: Lecturers and teaching-assistants were judged to be equally effective as tutors and equally contributed to students' success. Such division does, however, have a budgetary advantage. The median cost of lecturers (per hour) is almost twice as high as that of teaching assistants. Furthermore, employment of teaching assistants as tutors provides teaching training opportunities for junior faculty members as they are put in charge of the tutorials.

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